

MECHANICAL ENGINEERING, BS

Program Description

The Mechanical Engineering bachelor's degree program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. Mechanical engineering is a broad-based program that prepares you for a rewarding career in mechanical and related engineering fields. Course work for this program includes 72 credits in Engineering subjects, 32 credits in math and sciences and 25 credits in general education for a total of 129-131 credits in the bachelor of science degree. You will work with mechanical systems in the laboratories and receive an excellent mix of theory and application.

Program Highlights:

- Emphasis is on preparing you to solve real-world engineering problems.
- You will participate in multidisciplinary, industrial or research-based senior engineering design projects which emphasize teamwork, communications, project management, customer relations and ethics.
- You will learn numerous software packages for CAD, CAM, fluid dynamics, finite element analysis, and other applications.
- Cooperative education opportunities are available.
- Degree Concentrations — You must choose from among three concentrations: robotics and automation, vehicle systems, or general mechanical while studying mechanical engineering.
- Emphasis on fundamentals of engineering, applications of theory, traceability to first principles, and generous laboratory content to complement and reinforce theoretical understanding.

The **robotics and automation concentration** will give you skills through courses in machine vision, system integration, automated manufacturing, robotics, and programmable logic controllers.

The **vehicle systems concentration** addresses the performance of surface vehicles of all types (automotive, rail, terrain, watercraft, etc.) through a series of courses in vehicle dynamics, geometric dimensioning and tolerancing, vehicle testing, and vibration and noise control. The emphasis is on projecting performance through analytical skills and computer simulation, and testing using modern instrumentation.

The **general concentration** enables students to select courses from the concentrations described above as well as other Engineering subjects.

Cooperative Education:

Opportunities are available as part of this program for students who are academically qualified. A certificate that documents this practical training is available.

Program Learning Outcomes

- Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- Communicate effectively with a range of audiences

- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- Acquire and apply new knowledge as needed, using appropriate learning strategies

Degree Requirements

Departmental Requirements

Code	Title	Hours
Mathematics		
EGNR 340	Numerical Methods Engineers	1
MATH 151	Calculus I (a grade of C or better required)	4
MATH 152	Calculus II (a grade of C or better required)	4
MATH 251	Calculus III	4
MATH 308	Probability and Math Stats	3
MATH 310	Differential Equations	3
Sciences		
CHEM 115	General Chemistry I	5
PHYS 231	Appl Phys Engineer/Scientist I (a grade of C or better required)	4
PHYS 232	App Phy Engineer Scientist II	4
Engineering		
EGEE 210	Circuit Analysis	4
EGEM 220	Statics (a grade of C or better required)	3
EGEM 320	Dynamics	3
EGME 110	Manufacturing Processes	3
EGME 141	Solid Modeling	3
EGME 225	Mechanics of Materials	3
EGME 275	Engineering Materials	3
EGME 276	Strength of Materials Lab	1
EGME 337	Thermodynamics	4
EGME 338	Fluid Mechanics	3
EGME 350	Machine Design	4
EGME 431	Heat Transfer	3
EGME 432	Thermal and Fluids Lab	2
EGNR 101	Introduction to Engineering	2
EGNR 140	Linear Alg Num Apps Engineers	2
EGNR 265	C Programming	3
EGRS 460	Control Systems	4
Total Hours		82

Senior Sequence

Complete one of the following sequences:

Code	Title	Hours
Industrial Project		
EGNR 491	Engineering Design Project I	3
EGNR 495	Engineering Design Project II	3

Co-Op Project		
EGNR 250	Cooperative Education	2
EGNR 450	Cooperative Educ Project I	4
EGNR 451	Cooperative Educ Project II	3
EGNR 491	Engineering Design Project I	3

Research Project		
EGNR 260	Engineering Research Methods	2
EGNR 460	Engineering Res Project I	4
EGNR 461	Engr Research Project II	2

Technical Electives

Complete one of the following concentrations:

Vehicle Systems Concentration

(C or better grade required for all classes)

Code	Title	Hours
EGEE 280	Introduction Signal Processing	4
EGME 240	Assembly Modeling and GD&T	3
EGME 310	Vehicle Engineering	2
EGME 415	Vehicle Dynamics	2
EGME 425	Vibrations and Noise Control	4
EGME 442	Finite Element Analysis	3-4
or EGRS 461	Design of Control Systems	
Total Hours		18-19

Robotics and Automation Concentration

(C or better grade required for all classes)

Code	Title	Hours
EGRS 365	Programmable Logic Controllers	3
EGRS 385	Robotics Engineering	4
EGRS 430	Sys Integration/Machine Vision	4
EGRS 435	Automated Manufacturing System	3
General Concentration Elective		3-4
Total Hours		17-18

General Concentration

Code	Title	Hours
------	-------	-------

Select 17 credits from any approved Tech Elective courses (at least two of which are at the 400-level, and at most two at the 200-level) 17

EGEE 280	Introduction Signal Processing
EGEE 310	Network Analysis
EGEE 330	Electro-Mechanical Systems
EGEE 345	Fund of Engr Electromagnetics
EGEE 411	Pwer Distribution/Transmission
EGME 240	Assembly Modeling and GD&T
EGME 310	Vehicle Engineering
EGME 415	Vehicle Dynamics
EGME 425	Vibrations and Noise Control
EGME 442	Finite Element Analysis
EGMT 216	CAM with CNC Applications
EGNR 261	Energy Systems/Sustainability
EGNR 310	Quality Engineering
EGNR 346	Probability/Stats Lab Engineer

EGNR 361	Energy Sys Sustainability Lab
EGNR 490	Sp Topics in Engr: (Topic)
EGRS 215	Introduction to Robotics
EGRS 305	Robot Safe/Collabtive Robotics
EGRS 325	Industrial Control Systems
EGRS 365	Programmable Logic Controllers (if not used above)
EGRS 372	Mobile Robotics
EGRS 375	Cyber-Physical Sys & Security
EGRS 385	Robotics Engineering
EGRS 430	Sys Integration/Machine Vision
EGRS 435	Automated Manufacturing System
EGRS 461	Design of Control Systems

Total Hours 17

32 credits from Mathematics (including EGNR 340 Numerical Methods Engineers) and Natural Sciences is required.

General Education: All LSSU bachelor's degree candidates must complete the LSSU General Education Requirements.

A minimum of 124 credits (at the 100 level or higher) must be earned for graduation with a cumulative gpa of 2.00 or higher. A gpa of 2.00 or higher is also required in your Major, as well as in your General Education Requirements.